Econometrics of Financial Markets

COURSE DECRIPTION

The course introduces the basic topics of financial economics and proposes the quantitative methods currently used in the empirical analysis.
The course includes a review of some statistical concepts and introduces the use of the programming languages Matlab and Gretl.

OBJECTIVES
The students will be able to formalize currently used financial econometric models and to build the computational procedures to be used in their empirical analyses

MAIN CONTENTS

1. A review of some statistical concepts

- Decriptive statistics
- Random variables and probability distributions
- Expected value and variance of random variables
- Sample distribution of the sample mean

2. The linear regression model

- Basic assumptions
- Estimation with the ordinary least squares method (OLS)
- Algebric properties of the estimates
- Statistical properties if the estimates
- The Gauss-Markov theorem
- The unbiased estimate of the residual variance
- The coefficient of determination R^2
- The importance of the normality hipothesis
- Building the t-test nad the F-test. Test of hipothesis and confidence intervals
- Forecasting

3. Portfolio analysis

- Return and risk o an asset
- Expected return and variance (risk) of a portfolio
- The simple case of a portfolio which include two assets

4. Optimum portfolio theory and mean-variance models

- How to compute the efficient frontier: the Markowitz approach
- The inputs for Markowitz optimization
  - The market model
  - β as a risk measure
  - Rischio diversificabile e rischio non diversificabile
  - The estimation of the α and β coefficients of the market model
  - Accuracy of historical and adjusted β

5. Equilibrium models in the capital markets

- Capital Market Line (CML)

- Risk and return in an efficient market: Security Market Line (SML) or CAPM
  - CAPM and market model
  - ALFA value
  - CAPM and prices
- Testing CAPM: expectations *ex-ante* expectations and *ex-post* tests
  - the time-series approach
  - the cross-section approach
- Empirical tests of the CAPM: a review of some important results
  - The Sharp and Cooper test
  - The Lintner and Douglas test
  - The suggestions of Miller and Scholes
  - Measurement errors in the Betas and the bias in the CAPM parameters estimate
- CAPM and performance measures: the Jensen index

6. Efficient markets

- Some background
- Weak form tests
- Semi-strong form tests
- Strong form tests

7. References

Elton E.J., Gruber M.J., Brown S.J. and Goetzman W.N (2009),
" Modern Portfolio Theory an Investment Analysis" , John Wiley & Sons .